REMARKS

Applicants respectfully request the Examiner to examine the claims requested above.

VERSION MARKED TO SHOW CHANGES

IN THE CLAIMS

Please add claims 23-46.

23. (New) A method comprising:

(A) altering an address by masking a portion of the address having lesser significance than a least significant bit of the address containing a logic one value;

(B) performing an operation on at least the masked address to produce an index;

(C) obtaining information from a forwarding mechanism being addressed using the index;

(D) comparing the information with the masked address; and

(E) repeating (A-D) if the information does not match the masked address.

24. (New) The method of claim 23, wherein the index is produced by a hash operation on the masked address.

25. (New) The method of claim 24, wherein the obtaining information from a forwarding mechanism includes obtaining information from a bin of a hash table.

26. (New) The method of claim 23, wherein the address is a destination Internet Protocol (IP) address.

27. (New) The method of claim 23, wherein the address is a source Internet Protocol (IP) address.

28. (New) The method of claim 23, wherein the altering of the address includes providing a mask associated with the address and performing a bitwise AND of the address and the mask to produce the masked address.

29. (New) The method of claim 28, wherein the comparing of the information with the masked address further comprises:

determining if a length of the mask associated with the address is greater than a predetermined threshold; and

performing (E) if the length of the mask is greater than the predetermined threshold and the information fails to match the masked address.

30. (New) The method of claim 23, wherein the altering of the address by masking includes

providing a mask of length X-Y, where X represents a bit position of the most significant bit in the address and Y represents a bit position of the least significant bit containing a one; and

applying the mask to the address.

31. (New) A method of forwarding data comprising:

(A) receiving a search key;

(B) producing a masked search key by applying a mask to a portion of the search key starting at a least significant bit of the search key until a least significant bit of the masked search key containing a logic one value;

(C) performing a hash function on the masked search key to produce an index;

(D) comparing information stored within a bin of a forwarding mechanism, the bin being addressed by the index;

(E) determining whether a length of the mask is greater than a predetermined threshold concurrently with (C) and (D).

(F) repeating (B-E) for another search iteration if the information does not match the masked search key and the length of the mask is greater than the predetermined threshold.

32. (New) The method of claim 31, wherein, for each search iteration, the mask of the search key is shortened to exclude enough data to cause the hash function to produce a result that is different from a former index.

33. (New) The method of claim 32, wherein the shortening of the mask comprises, for each search iteration, shortening the length of the mask to X-Y bits, where X represents the bit position of a most significant bit in the search key and Y represents a bit position of the least significant bit in the search key containing a logic one value.

34. (New) The method of claim 31, wherein the search key comprises a destination Internet Protocol (IP) address.

35. (New) An address relocation unit for improving a longest match search, comprising:

a hash table including a plurality of bins;

a hash generator to produce an index from an input address and a mask, the index being used to recover data stored in a first bin of the plurality of bins;

circuitry to determine whether the data recovered from the first bin compares with the address; and

a mask decimation logic coupled to the hash generator, the mask decimation logic to shorten the mask supplied to the hash generator so that the hash generator produces a new index that differs from the index if the data recovered fails to compare with a portion of the address identified by the mask.

36. (New) The address resolution unit of claim 35, wherein the circuitry comprises

a storage element coupled to the hash table, the storage element to store the data retrieved from the hash table; and

a matching logic coupled to the storage element, the matching logic to compare the portion of the address identified by the mask with the data retrieved from the hash table.

37. (New) The address resolution unit of claim 36, wherein the storage element includes a plurality of registers.

38. (New) The address resolution unit of claim 36 further comprising:

a state machine coupled to the matching logic and the hash generator, the state machine to control generation of the new index by the hash generator.

39. (New) The address resolution unit of claim 35, wherein operations of the matching logic are independent of the data retrieved from the hash table.

40. (New) The address resolution unit of claim 35 being implemented as part of an input/output (I/O) interface within a switching device.

41. (New) A method of locating an entry in a forwarding database corresponding to a longest match of a search key, the method comprising:

performing a function on the search key to produce a current index;

searching a first location in a table identified by the current index for an entry that matches the search key; and

if no entry is found that matches the search key, each subsequent search iteration performing the following:

shortening the search key to exclude data to cause the function to produce a result that differs from the current index,

updating the current index with the result, and

searching a second location in the table that is identified by the current index.

42. (New) The method of claim 41, wherein the performing of the function includes the performing of a hash function.

43. (New) The method of claim 41, wherein each subsequent search iteration being performed if no entry is found that matches a length of the search key is greater than a predetermined length.

44. (New) The method of claim 43, wherein the searching of the first location includes searching of a bin of a plurality of bins associated with the table.

45. (New) A method of locating an entry in a forwarding database corresponding to a longest match of a search key, the method comprising:

generating indices for a hash table performing a hash function on the search key to produce a current index into a hash table;

searching a first bin in the hash table identified by the current index for an entry that matches the search key; and

if no entry has been found that matches the search key, for each subsequent search iteration:

shortening the search key to exclude data to cause the hash function to produce a result that is different than the current index,

updating the current index with the result, and

searching a different bin in the hash table that is identified by the current index.

46. (New) The method of claim 44, wherein each subsequent search iteration being performed if no entry is found that matches a length of the search key is greater than a predetermined length.

CONCLUSION

In view of the amendments and remarks made above, it is respectfully submitted that pending claims 23-46 are in condition for allowance, and such action is respectfully solicited.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on: July 6, 2001.

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